An Automatic Technique for Finding Faint Moving Objects in Wide Field CCD Images

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The traditional method used to find moving objects in astronomical images is to blink pairs or series of frames after registering them to align the background objects. While this technique is extremely efficient in terms of the low signal-to-noise ratio that the human sight can detect, it proved to be extremely time-, brain- and eyesight-consuming. The wide-field images provided by the large CCD mosaic recently built at IfA cover a field of view of 20 to 30′ over 8192^2 pixels. Blinking such images is an enormous task, comparable to that of blinking large photographic plates.

However, as the data are available digitally (each image occupying 260Mb of disk space), we are developing a set of computer codes to perform the moving object identification in sets of frames. This poster will describe the techniques we use in order to reach a detection efficiency as good as that of a human blinker; the main steps are to find all the objects in each frame (for which we rely on "S-Extractor" (Bertin & Arnouts (1996), A&ASS **117**, 393), then identify all the background objects, and finally to search the non-background objects for sources moving in a coherent fashion. We will also describe the results of this method applied to actual data from the 8k CCD mosaic.

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Special instructions: Category 28: this poster describes a data analysis method for finding faint moving objects in series of images. Although we developed it to find comets, it can be applied to asteroids and TNOs too Tue Aug 27 16:18:24 CDT 1996

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